

Chetan Reddy N

✉ chetanreddyn22@gmail.com | [Github](#) | [in LinkedIn](#) | [Website](#)

EDUCATION

Indian Institute of Technology Madras

Aug 2019 - May 2024

Bachelors (B.Tech) in Mechanical Engg, Masters (M.Tech) in Data Science | CGPA: 9.38/10 | Department Rank: 4/41

KTH Royal Institute of Technology, Stockholm, Sweden

Aug 2022 - Jan 2023

Semester Exchange | School of Electrical Engineering and Computer Science | GPA: 5.0/5.0

SCHOLASTIC ACHIEVEMENTS

- Among the **top 3 out of 50+ interns** nationwide to secure a pre-placement job offer at Adobe Research. 2023
- **One of the 7 students selected from India** for an in person internship at Hokkaido University, Japan 2022
- Recipient of the **¥ 1,60,000 JASSO Scholarship** awarded by the **Government of Japan**. 2022
- Awarded the **Prestigious Summer Research Fellowship 2022** by the Indian Academy of Sciences. 2022
- **Ranked 3rd** in a NPTEL MOOC course on **Data Structures and Algorithms**, enrolled by 25,000+ students. 🏆 2021
- Secured an **All India Rank 957** in JEE (Mains) 2019 out of **1 million candidates** across the country. 2019
- Secured an **All India Rank 931** in JEE (Advanced) 2019 out of 150,000 shortlisted candidates. 2019
- Achieved a **State Rank of 15** in Karnataka Common Entrance Test 2019 written by about **2,00,000 students**. 2019

RESEARCH EXPERIENCE

Human in the Loop, Safe and Verifiable Reinforcement Learning | IIT Madras

Chennai, India

Dual Degree Thesis | Guides: [Prof. Nirav Bhatt](#) and [Prof. Balaram Ravindran](#)

Aug 2023 - Present

- Conducted a literature review of 30+ papers on the overlap of **safe reinforcement learning** and **human in the loop RL**.
- Modified the DDPG algorithm to enable **action masking in continuous spaces** by leveraging a human-provided safe action set.
- Attained an average angle of 5° in the inverted pendulum environment while ensuring 100% safety in training and testing.

Safety Critical Navigation using Depth Information | KTH Royal Institute of Technology

Stockholm, Sweden

Graduate Research Collaborator | Guide: [Prof. Jana Tumova](#)

Jan 2023 - Present

- Developed control strategies to achieve obstacle avoidance with provable safety guarantees in an **unknown and stochastic environment** by using **control barrier functions (CBFs)**.
- Defined **new notions of safesets** that can be obtained from the depth images to construct the CBFs.
- Implemented the algorithm in simulation using **ROS** with a turtlebot equipped with an Intel RealSense RGB-D camera.

Use of Deep Reinforcement Learning in Autonomous Cars | Hokkaido University

Sapporo, Japan

Research Intern | Guide: [Prof. Hidenori Kawamura](#)

May 2022 - Jul 2022

- Investigated the use of RL to optimise traffic flow in scenarios like highway merge and intersection crossing in a simulator.
- Implemented the Dueling Double DQN Algorithm and tested it with different state space encodings to represent the traffic.
- RL-based autonomous cars **reduced the average congestion clearance time by 30%** relative to rule-based agents.

WORK EXPERIENCE

Improving Targeting Decisions with Causal AI | Adobe Research

Bengaluru, India

Summer Research Intern | Guide: [Dr. Atanu R Sinha](#) | *Patent under internal review at Adobe

May 2023 - Aug 2023

- Researched and implemented different algorithms for **causal inference** like **PC, FGES, FCI and LINGAM**.
- Developed a novel algorithm combining **deep learning with causal structure discovery** for improved marketing decisions.
- **Identified and analyzed metrics** for evaluating causal models implemented on **real and observational data**.

Clickbait Analysis of News Sites | Digital Outcomes

Mumbai, India

Machine Learning Intern | Guide: [Pranav Shah](#)

May 2021 - Jun 2021

- Worked on applying advanced ML techniques to identify whether a news headline is clickbait or not.
- Developed a **web scraping tool** to gather data from news websites and collected around **100,000 data points**.
- Built **SVM and decision tree models with TF-IDF embedding** and achieved an F1 score of 0.91 and 0.88.
- Achieved a higher F1 score of 0.94 using a transfer learning model with **BERT implemented in TensorFlow**.

- **Robotics:** Introduction to Robotics* | Safe Robot Planning and Control* | Control Systems | Automation in Manufacturing
- **AI/ML:** Reinforcement Learning | Pattern Recognition and Machine Learning | Data Analytics Lab | Big Data Lab
- **Mathematics:** Multivariable Calculus | Probability, Statistics and Stochastic Processes | Linear Algebra | Differential Equations
- **Computer Science:** Data Structures and Algorithms using Python | Design and Analysis of Algorithms

SKILLS

- **Programming Languages:** C, C++, Python (NumPy, Pandas, PyTorch, TensorFlow, OpenCV, Matplotlib, Seaborn, Rospy)
- **Tools:** Robot Operating System (ROS), MATLAB, Fusion 360, Git, \LaTeX , Linux, Google Cloud Platform (GCP)

KEY PROJECTS

Drone Swarm Challenge | Inter IIT Tech Meet 2023 - IIT Kanpur

Dec 2022 - Feb 2023

Developed a vision-based centralised controller to communicate with and control drones to move in a coordinated manner.

- Implemented a **multi-axis PID controller from scratch** for stable hovering and vision-guided rectangular motion.
- Developed a **Telnet interface for swarm communication** and a PID class for simultaneous control of multiple UAVs.
- Transformed the existing ROS-based communication framework into a python script making it **user-friendly and platform-independent**.

Competitive Multi-Agent Reinforcement Learning | RL Games Hackathon | Shaastra 2022

Dec 2021 - Jan 2022

Created bots using reinforcement learning to compete with other bots in a virtual two-player 2D game setting.

- **Winner of the competition** with over **700 participants across India** and earned a cash prize of Rs.10,000.
- Implemented two deep reinforcement learning models in **Pytorch** namely Policy Gradients and Deep Q Learning.
- Crafted a **novel feature engineering technique** inspired by the decision tree algorithm, doubling the average score earned.

Mission Planner for Autonomous Robots | Course Project - Introduction to Robotics

Aug 2022 - Dec 2022

Course Project for the introductory course to the Masters in Robotics Program at KTH Royal Institute of Technology, Sweden

- Implemented **Inverse Kinematics solution** for a 7 DOF robotic arm using its Denavit-Hartenberg parameterization.
- Coded **A* and Rapidly Exploring Random Tree (RRT)** algorithms from scratch for a bot following dubin's car dynamics.
- Achieved autonomous navigation and manipulation based on high level instructions by building a **mission planner for the TIAGo robot in ROS using behaviour trees**.

Wells Fargo Quantitative AI Hackathon | Shaastra 2022

Dec 2021 - Jan 2022

Forecasted the implied volatility surface of options over 60 trading days using 2.5 years of past volatility surface data.

- Secured **3rd place out of 500+ teams** registered across the country in the national-level quantitative AI hackathon.
- Attained an RMS error of 0.033 based on a univariate approach using ARIMA (Autoregressive Integrated Moving Average).
- Further implemented an **autoencoder decoder LSTM network** which decreased the RMS error by 15%.

Extra-Terrestrial Manufacturing | Course Project - Automation in Manufacturing


Feb 2022 - May 2022

Conducted a study on the production of oxygen using lunar regolith and the feasibility of setting up a factory on the moon.

- Designed the required space factory components in **Fusion 360**, addressing material handling systems and energy requirements for low-gravity operations.
- Analyzed the **manufacturing metrics and the economic viability** of setting up such a facility for future moon missions.

SOCIAL IMPACT

Coordinator of UpSkill | Shaastra 2021

- Worked in a team of 8 to promote computational thinking in schools impacting over **7000 school teachers** across India.
- **Moderated a virtual Panel Discussion** on Computational thinking with panellists from Google, Microsoft and ACM. 
- Solely responsible for striking a deal with Codingal, an ed-tech startup that served as the curriculum partner of UpSkill.

TEACHING AND EXTRACURRICULAR ACTIVITIES

- Conducted lab sessions as the **Teaching Assistant** for the **graduate-level course - ME5281 Machine Design Lab**.
- Served as a **mentor to six freshmen** at IIT Madras, facilitating their academic and co-curricular adaptation.
- Helped plan and organise large-scale games and ice breakers for the crowd at Saarang 2020, attended by 70,000+.
- **Sports**
 - **Athletics:** Awarded a silver medal in a state athletic competition by Anju Bobby George (former Indian Olympic athlete).
 - **Field Hockey:** Part of the winning team in the Intra IIT Madras Hockey Tournament 2022.